

# Slurry / Microsurfacing Taskgroup



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# Slurry / Microdurfacing

**Slurry seals have been used by Caltrans for several decades;**

- **Micro Surfacing typically has higher polymer content than that of PM Slurry Seal.**
- **System has the use of faster breaking chemicals to allow more of a chemical break than typically PM slurry seal.**
- **Aggregate is cleaner or higher SE requirements not necessary any harder.**
- **It may also be used as rut filler because it may be laid in multi-layers and is polymer modified to provide stability.**
- **When properly designed and applied under the correct conditions, it should perform for 7-10 years +.**

# Guidelines for Use

Where to use Slurry / Micro Seal treatments?

- On newer pavements
- On both low and high volume roads
- Anytime it can be demonstrated to be cost effective

# When and where are PM treatments appropriate?

- Factors to be considered
  - Existing pavement condition
  - Traffic levels
  - Climate
  - urban vs. rural settings
  - Availability of materials/contractors
  - Others??

# Benefits of Strategies

- Life Extension of the existing pavement
- Reduced noise, depending on the treatment
- Improved ride quality
- Improved skid resistance, or safety

# Estimated Life of Treatment

Treatment	Good Condition (PCI=80)	Fair Condition (PCI=60)	Poor Condition (PCI=40)
Slurry Seal	7 - 10	3 - 5	1 - 3
Micro-surfacing	8 - 12	5 - 7	2 - 4

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# Treatment Cost

Treatment	Cost, \$/sy
Crack Sealing	0.30 - 0.45
Slurry Seals	0.60 - 1.00
Microsurfacing	1.10 - 1.30
Cape Seals	1.50 - 2.00

# Microsurfacing Pilot Study 2001

## Report

**The purpose of the report was to provide a preliminary evaluation of phase 1 of a proposed three-phase process to introduce microsurfacing to Caltrans.**

**Phase 1 consisted of an evaluation of 7 projects contracted by Caltrans and constructed in the construction season of 2001.**

**Also included in the evaluation was one project constructed in the 1999 season, and one project done a under change order in 2001 (total of 9).**

**The projects were constructed under a specification and guideline developed by a Caltrans/Industry Task group in 1999.**



# Microsurfacing Pilot Study 2001

## Conclusion From the Review

**The major conclusion resulting from this review was**

- **Microsurfacing was a good surfacing system for preventative maintenance.**
- **However, there were issues that require attention including:**

# Microsurfacing Pilot Study 2001

## Workmanship:

**In many jobs, construction joints were poor. Both in longitudinal and transverse directions. ( where the equipment started and stopped runs ).**

**Problems such as drag marks, poor edge finish, poor surface texture uniformity in intersections, and rough handwork were noted.**

**In some cases, the mix apparently had too much water. This resulted in segregation of fines to the surface and an uneven, poor surface texture,**

**although subsequent skid resistance was tested as satisfactory.**

**Rutting occurred in isolated areas in some jobs. Specialty rut spreader boxes were not used and this may have contributed to the return of rutting. In the jobs where specialty adjustable edge boxes were used on shoulders, the finish on construction joints was significantly improved.**

# Microsurfacing Pilot Study 2001

- **Job Selection:** In several cases it appeared that existing poor pavement conditions including pumping resulted in early distress. Although isolated areas of existing poor pavement condition should not preclude the use of microsurfacing, pavements with extensive distress cannot be treated with this product. Untreated cracks contributed to early delamination and reflective cracking in the microsurfacing layer.
- **Climatic and Traffic Conditions:** The climatic conditions and traffic levels at lay down are important. Where the lay down conditions were cool and damp, cure took longer and, sometimes, raveling under traffic was observed. This also led to increased sweeping requirements during the days after laydown.

# Microsurfacing Pilot Study 2001

## RECOMMENDATIONS FROM 2001 PILOT STUDY

Recommendations resulting from the study findings suggest there should be continued Industry/Caltrans efforts to overcome these workmanship issues.

This would also include an ongoing review of the original pilots to determine long-term performance.

Outcomes would include a modified specification that addresses workmanship, job selection and construction practices.

A new guideline to assist design and field personnel in overcoming the observed problems would also be a product.

# Microsurfacing Pilot Study 2001

## Recommendations Continued

- 1. Establish another pilot study (phase 2) to resolve the workmanship problems and utilize warranties. Each pilot should require a detailed quality and testing plan as proposed in Appendix D.**
- 2. Establish a task force for phase 2 that includes a review group that will be involved in all phases of the project including job selection, post construction evaluation, and monitoring performance.**
- 3. Develop and carry out training program for the districts that addresses the following issues:**
  - a) Job selection criteria and surface preparation guidelines**
  - b) Inspection and testing**
  - c) Sweeping and post treatment**
  - d) Other aspects of microsurfacing technology**
- 4. Incorporate more guidance on the sweeping operations in the specification.**

# Micro surfacing Pilot Study 2001

## Recommendations Continued

- 5. Address allowable climatic application conditions in a tighter specification to avoid stone loss due to slow cure. Include direction on allowed conditions after lay down for up to 48 hours to prevent shedding caused by freezing.**
- 6. Create a modified micro surfacing guideline using the findings from this report (lessons learned) to include the following elements:**
  - a) Mix design in reference to conditions of laydown**
  - b) Process control**
  - c) Job selection criteria and distress evaluation**
  - d) Construction methods, equipment type and inspection**
  - e) Traffic control requirements**
  - f) Inspection methods and trouble shooting**
  - g) Materials requirements and on site control**
  - h) Immediate post construction monitoring and sweeping**

# Microsurfacing Pilot Study 2001

## Recommendations Continued

- 7. Include a requirement for a separate contract pay item for rut filling in each contract to ensure that rutting is properly quantified and the correct equipment is used (see Appendix E).**
- 8. Make edge appearance a requirement (e.g. by the use of edge boxes or other method - see Appendix E).**
- 9. Evaluate the cost effectiveness as a central determination for future work.**

# Task Group Over all Goals

Improve

Quality of Placement

Education of Buyer

Agency inspection Training

Specifications

Training Tools





# Short Term Deliverable

- **Review and adopt Micro Surfacing Specifications**
- **Equipment Specifications that allow the use of continuous machines**
- **Truck Mounted Joint procedure on Highways**
- **Include language discussing slurry seal ravel**
- **Include language of post sweeping**
- **Include language regarding current equipment calibrations and current mix designs.**
- **To allow for acceptance for same materials and equipment calibrations within certain time frame on different projects.**

# Short Term Deliverable

## Workmanship Guidelines

- Poor Ride
- Appearance
- Selection Process
- Hand work
- Drag Marks
- Joints



# Work to in Progress

## Industry Goals

- Improve quality of finished product
- Improve Safety
- Improve education of the buyer
- Improve agency training
- Create Contractor review system

## Caltrans Goals

- Workmanship guide lines
- Improve inspector training
- Guide line on where and when to use seals

# Long Term Develop

- **Field Evaluation Form**
- **Create a SSP**
- **Check list for Inspectors**
- **Workmanship Check list for Inspectors**